

vessel, the fine lines must be the vertical sections, whereas the fine lines of the ordinary steamer are the water lines or horizontal sections. Such change has been brought about by passing from long, narrow, and deep forms of ordinary vessels to the proportions of short, broad, and shallow ones; and, as has been demonstrated by experiments with paraffin models, the sharpening of buttock lines is more essential in this case than sharpening of water lines. In other words, if the motion of an ordinary vessel may be compared with that of a wedge propelled vertically, the motion of the yacht ought to be compared with the same wedge propelled through the water horizontally. On looking at the stern of the actual vessel you will observe that the whole motion of the water between the stern tubes will be effected solely in the direction of the vertical sections, or the buttock lines."

It is needless for our purpose to consider the minor details of a vessel so fraught with features of extraordinary interest. It may be well to point to the fact that the ship is to be steered, not by rudders, but by her screw propellers only, of which she has three of equal diameter (16 feet), as illustrated in our engravings. These screws are spaced 18½ feet apart, the central one being in the line of keel. Each screw has its own engine of 3,500 I.H.P.

We need hardly say we shall watch the trials of this ship when her machinery is completed, and report the results to our readers. Meanwhile we join in the tribute of praise which is being freely accorded in this country alike to her bold and adventurous designers, and to His Imperial Highness the Grand Duke Constantine of Russia, a highly scientific and accomplished naval officer, by whose influence, and under whose personal care, some of the greatest problems in steam navigation are being developed.

NOTES

THE ceremonies at Manchester in connection with the Victoria University last week were as successful as the momentous event deserved. The *conversazione* on Tuesday evening was brilliant and crowded. The meeting on Wednesday for the transaction of the business of the University was harmonious and satisfactory, while the banquet that succeeded was quite worthy of the Corporation, who acted as hosts. The address of that body to the Duke of Devonshire seemed to us to breathe the proper spirit, and to show that Manchester is quite alive to the importance of the great event which has been celebrated. But indeed we did not require any such evidence of the importance attributed to high education in Manchester; as Earl Spencer pointed out, the Manchester grammar and other schools are among the best in the kingdom, and the existence of Owens College itself is proof enough that Manchester thinks of something else besides the most effective way of loading cotton goods. The speeches were all good and appropriate; the Bishop of Manchester was as liberal and fair as he always is, and his claim for freedom of research and belief in his own line was heartily endorsed by Prof. Huxley, who replied to the toast proposed by the Bishop. Prof. Huxley hoped the time would come when such an institution as Owens would be found in every important centre—a hope we heartily echo. Mr. Freeman was forcible and sensible, and of course took occasion to correct the historical inaccuracy of some one who cherishes the belief that the University of Oxford was "inaugurated" in a desert instead of what was at the time a busy industrial centre.

IT is comforting to receive the assurance given by Mr. Mundella at the opening of the Central Schools of Sheffield last week, that as long as he has the honour to occupy the place he does in her Majesty's Government the quality of education and the standard of education should not be lowered. The State,

he maintains, having decided that the children of the country should receive education according to their needs and capacities and prospects in life, ought to give that education not only thoroughly, but generously and with an unstinting hand. With such a sentiment actuating the Vice-President of the Council, we feel that elementary education is safe from the raids of Lord Norton and his friends.

A SOMEWHAT laboured and diffuse article on "Scientific Arrogance" in Monday's *Pall Mall Gazette* comes to the following very sensible conclusion:—"It would appear that scientific arrogance, in so far as it has any reality, is but the obverse of popular ignorance. Let the ignorance be dispelled, and the mystery bred of it will vanish. Let some rudiments of exact knowledge, some grounding in the methods of scientific reasoning, and some notions of the nature and ends of scientific work, be made part of our general scheme of instruction, and scientific dogmatism will be impossible. Let the mind be trained betimes to walk modestly and warily, as all true leaders of knowledge have walked, by the light of diligent and patient inquiry, and the spectre of scientific arrogance will disappear." One more argument for the retention of the Fourth Schedule. Perhaps even Lord Norton might put himself to school to some advantage after this recipe.

THE new Matriculation list of the London University bears ample evidence to the success of the step recently taken by the Council in admitting women to its degrees. In the Honours Division the third place is occupied by Edith Sophia Callet, from the North London Collegiate School. Altogether about one-sixth of the names on this Division are those of girls, and the proportion on the other Divisions is quite as great.

THE New South Wales Government have done a creditable thing in erecting an obelisk on the spot occupied by the Transit instrument in the old observatory at Parramatta, established by Sir Thomas MakDougall Brisbane in 1822. The building has long been swept away; many valuable observations were made in it by Mr. Charles Rümker and Mr. James Dunlop, and it was only right that the exact position of the Transit instrument should be permanently marked, so that, if necessary, future verification might be made. The first suggestion of the obelisk was made by Mr. Tebbutt so long ago as 1870, and it is gratifying that the New South Wales Government has so much regard for science as to act on Mr. Tebbutt's suggestion.

WE have a note from General Myer, dated July 1, stating that at the request of Prof. Wild, of St. Petersburg, the date fixed in his letter of May 4 changing the time of taking the International Simultaneous Meteorological Observations to a time thirty-five minutes earlier than at present, or to oh, 8m. p.m., Greenwich time, is changed from September 1, 1880, to January 1, 1881, a change with which the numerous observers over the world who make the observations from which the U.S. Weather Maps are constructed will doubtless concur.

WE regret to announce the death of Mr. W. A. Lloyd, who has done so much for the improvement of marine aquaria. Mr. Lloyd, it will be remembered, was for long connected with the Crystal Palace Aquarium.

FROM the *Gardeners' Chronicle* we learn that a committee, comprising some of the leading botanists and horticulturists of Berlin, has set on foot a project to erect a memorial stone on the grave of the late Karl Koch, and appeals through the press to his friends and admirers for subscriptions wherewith to carry out the project in a manner worthy of him whose memory it is desired to perpetuate. Subscriptions may be sent to Herrn Späth, Baumschulbesitzer, 154, Köpenickerstrasse, Berlin, S.O., and will be publicly acknowledged.

PROF. MCK. HUGHES, of Trinity College, Cambridge, writes to us as follows:—"I am writing the life of Prof. Sedgwick, but I want much which I fail to find in the mass of MS. placed in my hands, especially letters from himself giving an account of contemporary persons and events. Can any of your readers help me in this matter?"

WE take the following from the *New York Nation*:—"For the English-speaking race, wherever planted, we should have supposed NATURE to be a sufficient scientific medium, and entitled to universal support. We are partly confirmed in this view by the quotations from NATURE in the first number of *Science*, a quarto weekly journal, edited by Mr. John Michels, and published at 229 Broadway, in this city. Nevertheless, the editor's statement that the enterprise has been begun 'after consultation with many of the leading scientists in this country,' and his list of co-labourers seem to point to a real want, and to entitle this new 'record of scientific progress' to a friendly welcome. Its present size is sixteen pages, including the advertising sheet. The opening article, on the United States Naval Observatory, is from the pen of Prof. F. S. Holden." We wish our new contemporary every success, and trust that it may be the means of spreading a wide interest in science on the other side of the water.

THE half-yearly general meeting of the Scottish Meteorological Society was held yesterday. The business was: (1) Report from the Council of the Society; (2) Proposed Inquiry by the Society into the Relation of Climates in Scotland to the Growth of Trees, by Sir Robert Christison; (3) Relations of Weather to Deaths from Scarlet Fever and Whooping Cough, in Thirty-one British Large Towns, by Dr. Arthur Mitchell and Alexander Buchan, secretary; (4) Anemometer for ascertaining the Direction of the Wind with reference to a horizontal Plane, by Alexander Frazer, M.A., optician.

PROF. A. H. CHURCH, late of the Royal Agricultural College, Cirencester, has begun a course of lectures on Agricultural Chemistry at the Wilts and Hants Agricultural College, Downton, near Salisbury. There are many characteristic features in the farming of the district, well illustrated on the extensive farm of the new college. These afford both valuable illustrations and important subjects of investigation to the agricultural chemist as well as to the botanist and geologists. We hope that this new institution, over which Prof. Wrightson presides, will occupy itself not only in agricultural teaching, but in agricultural research, and develop, after a time, into a "Versuch-Station" of no little value.

THE continued wet weather at Carlisle, which lasted without intermission from Monday evening to Thursday at noon, rendered it extremely difficult to do justice to one of the finest exhibitions ever held by the Royal Agricultural Society. Among the most important of the novelties was Mr. Darby's steam digger. This instrument is intended to supersede the steam-plough by producing at once a pulverising effect superior to that of the combined action of plough and cultivator, and equal to that produced by the spade. The idea is old, but up to the present time it has not been successfully applied. Mr. Darby's digging-machine consists of three sets of prongs of fourteen each, arranged on three cross-bars twenty-feet wide. Each cross-bar is worked independently and in succession by a separate crank-shaft. The earth is moved to the depth of six to ten inches, and by the action of the revolving crank-shafts the raised sod is pitched backwards and neatly inverted. The surface is left somewhat too flat for harrowing, but a second digging renders the work much more efficient. The greatest drawback to this ingenious machine lies in its weight. When charged with coal and water the engine and digger unitedly weigh fourteen to fifteen tons. Experiments in the trial fields showed that three-fifths of the

power were absorbed in moving the implement over the ground. There were no new forage plants exhibited, and the stands devoted to manures and feeding-stuffs contained no articles save those with which we were familiar. In the five stock sheds the most interesting exhibits were the mountain-sheep peculiar to Cumberland and the adjoining counties. The Herdwick sheep are harder than the Scotch black-faced breed. They are able to thrive on the poorest land imaginable, and manage to leave a good profit in the hands of the Dalesmen who own them. Thanks to the Herdwick race of sheep, the bad times of which we have heard so much are unknown in the Lake district. Another excellent breed, not often seen out of their own locality, which lies in West Yorkshire and East Lancashire, is the Louks. This race, unlike other kinds of sheep, is well suited to the damp and mossy lands lying between the hills of mountain limestone which form this part of England. Their faces are speckled, black and white, and both sexes are horned. They are readily distinguished from the Highland black-faced breed by the evidently better quality of their wool. A third race unfamiliar to the bulk of English farmers is the "Crag" or "Limestone" sheep, which occupies the highlands of the same district as the Louks. The crag-sheep are adapted for a dry and poor pasture, and can do without water. The louk and the crag-sheep therefore offer good instances of the adaptability of different races of animals to their environment.

THE Zoological Station established last year in connection with the University of Aberdeen, at Stonehaven, is at present in process of erection near Cromarty. The work will be carried on throughout August and September, and part of October, under the superintendence of George J. Romanes, F.R.S., and Prof. J. C. Ewart. Those desirous of taking advantage of the station are requested to communicate with Dr. Ewart, Dunskaith, Ross-shire.

THE Sydney papers state that some important gold discoveries have been made in the Bathurst district near Tuena, and that in one claim a bushel of broken quartz yielded two pounds of gold. A very rich gold-field has also been found at the Margaret River, in the Northern Territory of South Australia.

THE Executive Committee of the International Medical Congress for 1881 made their report to the General Committee of this Congress, which met at the College of Physicians on Tuesday last week. The officers of the Congress were proposed and nominated. The sections were agreed upon, and the treasurer, Mr. Bowman, announced that large subscriptions had already been received. It was agreed that the time of meeting of the Congress should be from August 3 to 9, 1881. The president of the Council of the British Medical Association stated that the Council of that body had postponed their meeting to the following week. It was also announced that the Congress would meet in rooms granted for the purpose by the University of London, the Royal Society, and the other learned societies meeting in Burlington House, so that the sections will be all practically under the same roof. The president of the Congress will be Sir James Paget, and there will be fifteen sections in all.

IT is intended to hold an International Congress of Commerce and Industry at Brussels, from September 6 to 11. M. Antoine Dansaert is to be the president, and the meeting will take place under the patronage of the King of the Belgians.

ACCORDING to the *Electrician*, a remarkable instance of telephony is exciting considerable interest throughout South Australia and among the scientific world in particular. By means of an improved telephone the Adelaide Post Office chimes have been clearly heard at Fort Augusta, a distance of 240 miles.

MR. G. F. H. MILNE, owner of the fossil forest recently discovered at Oldham, and referred to in NATURE at the time,

has offered to allow the Oldham Corporation to have care of it, and make a charge to visitors, the money to be applied towards a public museum. No doubt the Corporation will accept this handsome offer.

At the Rheims meeting of the French Association M. Gariel will give a public lecture on Radiant Matter, with Mr. Crookes' experiments, and M. Perier on the Law of Selection. The meeting of 1881 will be held at Algiers, and an excellent paper has been published in connection therewith by M. Macarthy, president of the Society of Natural Sciences of Algiers. This physicist settled in Algiers thirty years ago, and holds the position of librarian of the National Library of Algiers; in his *brochure* he reviewed all the different topics which might be submitted to the several sections of the Association.

A VIOLENT shock of earthquake occurred at Manila and throughout the Island of Luzon on July 18, which did immense damage, totally destroying several government buildings and other houses. Some of the native inhabitants were killed, but no Europeans suffered any injury. A slight shock was felt also on the 17th inst.

On July 14 the French Chamber of Deputies adopted a proposition of M. Lockroy, that a sum of 3,700,000 francs originally intended to rebuild the Palace of the Tuileries should be devoted to enlarge the national library, which will be quite isolated from other houses. The sanction of the Senate will be asked next session, but not a single representative having objected, the result is not dubious, and preparatory steps will be taken very shortly to execute this great measure of preservation and improvement.

In an interesting article on "Mistakes about Snakes," by Mr. Arthur Stradling, in the *Field* of the 17th inst., the author gives an *exposé* of the famous Indian basket trick, in which a boy is shut up in a basket and apparently put to death by sword-thrusts, but suddenly appears among the company uninjured. The narrative is too long for quotation, and we recommend our readers to obtain a perusal of the original.

THE following is the title of the essay to which the "Howard Medal" of the Statistical Society will be awarded in November, 1881. The essays to be sent in on or before June 30, 1881. "On the Jail Fever, from the earliest Black Assize to the last recorded outbreak in recent times." The Council have decided to grant the sum of 20*l.* to the writer who may gain the "Howard Medal" in November, 1881. Further particulars or explanations may be obtained from the Assistant Secretary, at the office of the Society, King's College entrance, Strand, London, W.C.

M. HERVÉ-MANGON, the director of the Conservatoire des Arts et Métiers, has compiled a catalogue of the celebrated Vaucanson collection; it will be very shortly placed at the disposal of the public in the Portefeuille Industriel, a special library opened in the Conservatoire for the communication of designs and documents relating to industry. The course of public experiments is attracting an unprecedented number of visitors to the galleries. Every week a programme of the exhibits is posted on the walls outside the buildings.

THE Manchester Scientific Students' Association is a busy society, as its Report for 1879 shows. It contains reports not only of various lectures and papers read at its meetings, but interesting accounts of the numerous excursions made by the members; these are occasionally illustrated, the illustrations being sometimes rather rude.

SUPPLEMENT No. 5 to the U.S. *National Board of Health Bulletin* contains a report of the proceedings at a conference on

Vital Statistics held at Washington on May 6 last. There is an interesting discussion on the subject of a Standard Nomenclature, with special reference to that adopted by the Royal College of Physicians of England; and appended is a very detailed nomenclature of ophthalmology and otology, by Dr. S. M. Burnett, of Washington.

AMONG the papers in the forthcoming number (vol. iii, No. 1) of the *American Journal of Mathematics* are the following:—"Regular Figures in *n*-Dimensional Space," by W. J. Stringham; "On the Algebra of Logic," by C. S. Peirce; "On the General Equations of Electromagnetic Action, with Application to a New Theory of Magnetic Attraction, and to the Theory of the Magnetic Rotation of the Plane of Polarisation of Light," by H. A. Rowland; "On Certain Ternary Cubic-form Equations," by Prof. Sylvester.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus erythraeus*) from India, presented by Mrs. C. Salvin; a Common Badger (*Meles taxus*), British, presented by Mr. Frank G. Haines; a Huanaco (*Lama huanacos*) from Bolivia, a Common Rhea (*Rhea americana*) from South America, presented by the Marquis of Queensberry; a Common Paradoxure (*Paradoxurus typus*) from India, presented by Col. Sturt; four Ring-tailed Coatis (*Nasua rufa*) from South America, presented by Lieut.-Col. J. A. Smith, 1st W.I. Regt.; a Common Hedgehog (*Erinaceus europæus*), British, a Greek Land Tortoise (*Testudo græca*), European, presented by Mr. L. C. Brook; two American Darters (*Plotus anhinga*) from Brazil, presented by Mr. Gerald Waller; a Goffin's Cockatoo (*Cacatua goffini*) from Queensland, presented by Miss Bartlett; two Red-legged Partridges (*Caccabis rufa*), two Common Buzzards (*Buteo vulgaris*), European, presented by Mr. W. H. St. Quintin; a Common Heron (*Ardea cinerea*), European, deposited; a Common Seal (*Phoca vitulina*), British Seas, two Japanese Pheasants (*Phasianus versicolor*) from Japan, a Bar-tailed Pheasant (*Phasianus reevesi*) from North China, purchased; a Burchell's Zebra (*Equus burchelli*) from South Africa, received in exchange; two Lions (*Felis leo*), an Eland (*Oreos canna*), born in the Gardens.

OUR ASTRONOMICAL COLUMN

THE COMET OF 1668.—There is one point in the history of this comet which we do not remember to have seen mentioned since its supposed reappearance in 1843 revived the attention that was directed to it early in the last century, and it is one which, if accepted, bears materially upon the question of identity. Pingré has no reference to it in the account of the comet of 1668 in his "Cométographie." In the report of the observations made by the French Jesuit Valentin Estancel at San Salvador, in the *Philosophical Transactions*, No. 105 (1674, July 20), which is stated to be a translation from the *Giornale de Letterati*, No. 9, published at Rome in September, 1673, we read after the description of the evening observations commencing March 5, 1668:—"It may be taken notice of that a month before, upon a report that a comet had been seen towards the morning in the horizon of the rising sun, and certain Carmelites that live upon a hillock of the said town having affirmed that they had observed it several times, our P. Estancel began to doubt whether the comet he saw were not the same which, more swift than the sun, according to the succession of the signs, might within that time have got clear of the solar rays; and his suspicion grew the stronger because the head was then turned towards the sun and the tail towards the west, opposite to the same." But if the comet of 1843 were in perihelion near the time which Henderson found it necessary to assume in order to satisfy the indications of his Goa chart, it would not have preceded the sun in the first week in February, but would have had considerably greater right ascension, so as to be visible only in the evening. Henderson's direct orbit, however, which upon the whole accords much better with his data, would place the comet in R.A. 311°, Decl. -7½° on February 5, at 17h. San Salvador time, so that it would precede the sun, which was then in R.A. 320°.